

REMARKS

In the amendment presented above, claims 27-34 have been cancelled as drawn to a non-elected invention, without prejudice to Applicant's right to pursue the subject matter thereof in one or more related applications. Claims 1, 2, 5, 6, 12, 16, 19, 23, and 26 stand rejected under 35 U.S.C. 102(a) as being anticipated by U.S. Patent No. 6,347,976 to Lawton et al. Claims 13, 15, and 20-22 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Lawton. Claim 18 stands rejected under 35 U.S.C. 103(a) as being unpatentable over Lawton in view of U.S. Patent No. 5,588,901 to Rubey, III et al. Applicant has amended the claims to more particularly define the present invention over the cited prior art. In the amendment presented above, Applicant has cancelled claim 12, deleted a portion of claim 5, and incorporated the limitations of cancelled claim 12 and the deleted portion of claim 5 into independent claim 1. The amended claims are clearly patentable over the cited prior art.

More specifically, amended claim 1 recites:

A method for removing target material from a substrate, the method comprising directing a supply of particulate material toward a target zone of target material present on the substrate and directing radiant optical energy toward the target zone, **the radiant optical energy interacting with the target material and the particulate material** to thereby promote removal of target material from the substrate, **wherein the particulate material is a material in solid state at ambient temperature and the radiant optical energy produces a sublimation interaction between the radiant optical energy and the particulate material.**

Amended claim 1 requires that the radiant optical energy interact with the particulate material in a solid state at ambient temperature and produce a sublimation interaction between the radiant optical energy and the particulate material. The Examiner has stated that the particulate of Lawton includes CO₂ "pellets", and thus that the particulate is a solid state

particulate at ambient temperature. The Examiner refers to Col. 3, lines 30-31 of Lawton in support of this assertion. However, Col. 3, lines 30-31 does not state that the CO₂ particulate is in solid pellet form at **ambient temperature** as required by claim 1. In fact, CO₂ is a cryogenic particulate that is used in the form of **frozen** pellets (Col. 5, lines 22-27). CO₂ is used as a cooling agent to overcome the problems associated with the deleterious effects of high temperature paint removal (Col. 1, lines 34-36 and 51-57), and is a desirable choice because it is usually desirable for the particle stream to be at a temperature well below the ambient temperature in order to quickly cool the substrate such that the substrate does not sustain heat damage (Col. 2, lines 5-10 and 32-38). Thus, the CO₂ pellets of Lawton are clearly not a solid state particulate at ambient temperature as required by claim 1. Moreover, the radiant energy source 120 of Lawton operates to pyrolyze the coating to be removed. Nowhere does Lawton teach or suggest a radiant energy source producing sublimation interaction between the radiant energy and particulate matter, let alone a radiant energy source producing sublimation interaction between the radiant energy and particulate matter that has a solid state at ambient temperature as required by claim 1.

The prior art reference to Rubey, III et al. does not remedy the shortcomings of Lawton. The Examiner asserts that Rubey, III discloses the use of bicarbonate of soda (sodium bicarbonate) as being well known for "a cleaning process," and that it would thus be obvious to use it as the particulate. However, Rubey, III does not remotely disclose or suggest directing radiant optical energy toward a target zone as required by claim 1, let alone using radiant optical energy to produce a sublimation interaction between the radiant energy and particulate matter that has a solid state at ambient temperature as required by claim 1. Instead, Rubey, III simply discloses a media delivery system for delivering particulate.

Applicant's invention functions by supplying radiant optical energy to rapidly heat a particulate which is in the solid phase at ambient temperature. As noted in the Specification (page 8, line 20 to page 9, line 21), such heating causes the solid phase particulate to undergo sublimation to a gas that produces rapid evolution of gas and a pressure blast which aids in exhaust of the particulate and substrate material. Particulate material which is in the solid form at ambient temperature but rapidly decomposes to evolve to a gas on heating (sublimation) has been found to achieve the best results (e.g., the use of such material has been repeatedly found to achieve higher levels of media removal and lower levels of residual soot for exhaust (Specification, page 9, lines 4-6)). This phenomenon is believed to control the oxidation of the media and to provide protection for the exposed substrate while enhancing the soot removal in the compressed air stream (Specification, page 9, lines 13-17).

Additionally, the radiant optical energy can soften the media and allow the particulate in solid form to become embedded in the coating. When sublimation of the embedded particulate occurs under rapid heating of the flashlamp, the embedded particulate further disrupts the integrity of the coating, which assists with its removal (Specification, page 10, lines 6-16).

The invention of the present application as recited by claim 1 thus requires a method in which radiant optical energy is used in conjunction with a particulate material which is in solid state at ambient temperature. The radiant optical energy produces a sublimation interaction between the radiant energy and particulate matter that enables a rapid evolution from particle to gas, without requiring cryogenic processing (e.g., the **frozen** CO₂ pellets of Lawton) to produce the particulate material.

Thus, the cited prior art fails to teach or suggest important features of amended claim 1. For these reasons, amended claim 1 is clearly patentable over the cited prior art. Similar arguments apply to independent claim 26.

Claims 2, 5, 6, 13, 15, 16, and 18-24, all of which depend from claim 1, are patentable for the same reason that claim 1 is patentable, and for reciting additional limitations not shown in the cited art.

In light of all of the above, it is submitted that the claims are in order for allowance, and prompt allowance is earnestly requested. Should any issues remain outstanding, the Examiner is invited to call the undersigned attorney of record so that the case may proceed expeditiously to allowance.

Respectfully submitted,



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